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ORIGINAL ARTICLES.

DRESSINGS AFTER INTRA-OCULAR OPERATIONS.

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After Graefe had advocated the roller bandage for severe injuries of and operations on the eye, it became and remained the standard dressing for nearly half a century. The material, it is true, was changed gradually, the charpie being replaced by cotton and the linen by aseptic gauze; but the mode of application and the object to protect and immobilize the eye, remained the same.

Its defects have been generally felt and within the last twenty years numbers of new methods have been proposed and tried. Chisolm,[1] in 1886, discarded the bandage and simply closed the lids with a strip of insinglass plaster; adding later on a piece of moist gauze beneath.[2] His treatment was followed by Michel, Gifford, Murrel, De Wecker and others. Czermak,[3] in 1893, left the eye entirely free and protected it only against possible injuries by a hollow mask. Of the several forms the wire-mask of Fuchs is probably the best known; others are made of silk, aluminum, celluloid and were introduced by Wolffberg, Snellen, Frothingham, etc. The last step was made by Hjort[4] of Christiania, in 1897, who left the eye open without any protection whatever.

These different methods I will designate for the sake of briefness as the "bandage", the "strip", the "free", and the "open" methods respectively and will discuss the merits and disadvantages of each.

Graefe thought, that besides protecting the eye against accidents, the bandage, if somewhat firmly applied, would immobilize the eye, and he called it a "pressure-bandage" (Druckverband). But the motions of the eye cannot be prevented, no matter how tightly it is used, because the contents of the orbit behind the eyeball are elastic, and the counter pressure is therefore wanting. Another erroneous idea, which prevailed for some time, was that a pressure bandage would insure a better coadaptation of the lips of the wound and its quick and regular union. Just the opposite is the fact. Every pressure tends to make the wound gape and to retard its closure. This can easily be demonstrated by taking a soft rubber ball, making a section similar to the one made for extraction of cataract, and applying pressure in different directions. Arlt[5] early opposed the idea of producing any pressure and made the following statement: "The object of the bandage is not to exert a pressure upon the eye, but to restrict its motions and especially to prevent as much as possible the movements of the lids, and to moderate the light." This quotation also shows a modification of the belief in the immobilizing power of the bandage upon the eyeball, laying the stress on its action upon the lids. This latter is now considered by many to be a disadavantage rather than a benefit, because they believe that the opening and closing of the lids promotes the flow of the tears, and that this is a barrier against infection. These points will be considered in detail later on. The moderation of the light can be just as easily accomplished by other methods. Protection against traumatism is certainly better afforded by the mask: That pressure interferes with the regular closure of the wound is demonstrated by the fact, that reopenings of the latter take place more frequently with this than with any other method. Furthermore, the bandage very often becomes disarranged, especially during the night and in female patients. Then, too, it is not easily removed and reapplied, requiring the raising of the head, which causes many patients to strain. In general it would seem that the disadvantages of the bandage preponderate.

For the original strip method it was claimed, that it did not allow the tears to accumulate and that inspection and dressing were facilitated. But isinglass plaster, glued directly upon the

lids, cannot be easily removed. There is usually some traction and too much manipulation of the lids, which might be dangerous in unruly patients. Accordingly Chisolm was soon induced to substitute for his simple strip of isingless plaster gauze or cotton, held in place by adhesive plaster, attached to the cheek and forehead. After this change was made, there remained no essential difference between this method and the bandage as far as the retention of tears and the supposed increased danger of infection are concerned. But the main objection to this method is, that it does not give sufficient protection against injuries from the hands of the patients or from any other source and resulting infection. That these accidents happen too frequently to be disregarded, is the experience of every operator. That it is our duty to our patients to give them the best possible protection after any operation is a surgical maxim.

The free method fulfils this requirement satisfactorily, much better than the old bandage, especially against gross traumata; and the mask is easier to remove and reapply. I will postpone the consideration of the second feature of this method, i.e., that the eye itself is left free.

The open method offers absolutely no protection to the operated eye and in my judgment is contrary to the fundamental principles of conservative surgery and common sense. On this point there seems to be consensus of opinion. For with the exception of his countrymen, Borthen[6] and Schioetz,[7] Hjort has found no followers. His reports show a fair percentage of recoveries; but in his last publication[8] he describes some cases of injuries and secondary infection, which would most probably have been prevented by proper protection. Some years ago I read of an instance, where after a cataract extraction the negro patient rode twenty-five miles to his home with his eye open and with no damage resulting. But such exceptional cases cannot be taken as the guide for our conduct.

For the above reasons, it appears to me, that the mask of the third method is superior to any feature of the other three. The particular pattern is a matter of taste. I myself prefer the aluminum mask, one of which I will pass around. If I am not mistaken, this kind was first used by Snellen. The concavity is deeper than in the Fuchs wire mask and the latter sometimes presses upon the eye, as you may convince yourselves. Furthermore the binding tapes frequently become disarranged during sleep, and it is not as easily and quickly changed as Snellen's.

The latter is held in position by a strip of adhesive plaster running from the nose to the temple. With good adhesive plaster there is hardly any probability of it coming loose, but if this should happen, it would be easy for a nurse or any one else to replace it. Another point in its favor is the fact that it can be easily sterilized.

The only remaining question then is: shall we adopt the free method in toto, that is, leave the eye perfectly free below the shield, or shall we combine it with the second and close the eye in some manner?

The advocates of the free method claim, that the movements of the lids favor the normal flow of the tears; that this should not be interfered with, because it is the best auto-disinfection; Hjort calls it the "physiological toilet of the eye". They attribute antiseptic properties to the lacrimal fluid and maintain, that when the lids are kept closed, pathogenic germs are more likely to increase and that frequently a slight discharge is caused thereby. Their conclusion is, that any closure of the lids increases the danger of secondary infection of the wound.

Whether the lacrimal fluid is really antiseptic is still an open question. While the investigations of Bernheim[9] and Bach[10] seem to substantiate this theory, later ones of Ahlstroem[11] and van Stort[12] failed to establish any antiseptic power.

In regard to the flow of the tears, this is certainly not decreased considerably under a light cover, as the movements of the lids are not prevented altogether. Furthermore, the secretion of the lacrimal gland is a continuous one. On the other hand, the lids do not slide so smoothly upon the eyeball, that a large wound is free from irritation; this may hold good for some cases, but certainly not for the large majority. Whenever the lips of the wound are not in the most perfect coadaptation, movements of the lids are bound to irritate it. Does not everybody instinctively close the eye after even a slight injury and enter our offices having it tied up in some manner? They do so, in order to prevent movements of the lids, which irritate the wound and are painful to them. There is a case on record, where the patient everted the corneal flap by closing the eye after having opened it very widely. Too frequent opening of the lids, moreover, may be dangerous on account of the change in the intensity of the light and the repeated stimulation of the iris.

The claim, that by closure of the lids the danger of secondary infection is increased, is not upheld by the statistics; suppuration

of the wound have been just as frequent in the one as in the other method. Not laboratory findings but the experiences of practice must decide such questions. On the other hand a closed eye is certainly better protected against infection from germs in the air. Rare as these cases may be, they cannot be denied altogether. Therefore the one possibility of infection is counterbalanced by the other. But my own experience does not agree with the statement, that pathogenic organisms are more likely to increase under the cover and that a slight conjunctivitis is often caused by it. During the last ten years I have used the two methods alternately, in a number of instances on the two eyes of the same patient, and I have more frequently seen a conjunctivitis ensue in the eyes which have been left free. In the five cases of suppuration, which I have had after extraction during 25 years of practice, the cause of the infection could always be traced and could in no instance be attributed to the bandage. In the cases, where the two methods were used in the same patients, I questioned them carefully, as to which was the most pleasant and which they preferred, with the unanimous verdict in favor of having the eye gently closed. They stated, that they felt more comfortable and safer.

The method therefore, to which I have come as the result of ten years' experimenting is a combination of the plaster and the free method, taking the best features of each. The lids are covered with a thin layer of gauze and cotton or cotton alone, which is held by a strip of adhesive plaster running from the forehead to the cheek. Over this is placed the shield, which is held by a strip running from the nose to the temple. At the dressings only the upper parts of the plaster are detached and are afterwards reapplied.

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PARTIAL ABSCISION OF THE ANTERIOR CAPSULE IN CATARACT EXTRACTION.

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In my own experience the anterior capsule has proved to be the greatest obstacle to obtaining high precentages of vision after the removal of the lens in the operation for cataract. That others are likewise troubled by this membrane is best evidenced by the forceps devised for its total removal, as well as by the frequent revivals of the old operation of delivering the lens within its capsule. The relations of the capsule and the zonule to the ciliary region are such that this last mentioned procedure has never appealed to me, because of the risk from possibly imperative, yet really unjustifiable, injury during the operation, and the long train of evils that so easily results from such injury.

The ordinary method of extraction with iridectomy, when no shreds of anterior capsule have been left in the pupil, has yielded results so satisfactory and permanent that very little more could be desired. In the cases where posterior capsules of sufficient density to cause much visual disturbance have existed, they have usually proved to be very delicate and have readily yielded to the needle-knives devised for this purpose. However, when they are superimposed and reinforced by the anterior capsule the problem becomes difficult, and in this is to be found the chief objection to delivery of the lens from its capsule by means of the sickle needle or the cystitome. After such delivery the anterior capsule too frequently drops back into place, or shreds from it remain so numerous across the pupil as to partially defeat the purpose of the operation. Taking the central portion away by means of forceps is open to the objection that the zonule is liable to become ruptured, which may easily lead to grave deep-seated mischief.

During the discussions upon the best management of cataract at the recent meeting of the American Medical Association, it occurred to me that the least violence to the eye would take place if the anterior capsule could in some way be abscised over the pupillary region. I have since then tried this procedure, with a result so entirely free of anterior capsule in the pupil and a clear space so much more extensive than heretofore obtained

with the sickle needle or the cystitome that it seemed worthy of mention.

After the corneal incision and the iridectomy had been made, the closed blades of a DeWecker's scissors were slipped in between the iris and the lens, then opened, again closed, and withdrawn. The cortex of the lens did not come forward as usual after rupture of the capsule, and nothing seemed to have been accomplished. The division of the capsule was completed with an ordinary sickle needle. Healing was prompt and uneventful. Four weeks later, with proper correction, vision was practically normal. Both the focal light and the ophthalmoscope showed a very thin posterior capsule, and here and there in the periphery of the widely dilated pupil remnants of the anterior capsu'e. The probable reason for this result is that the capsule was buttonholed at its center by the scissors, but not sufficiently to admit of the passage of the lens. This central buttonhole, however, is just what is needed for securing the desired clear pupil.

Actuated by the failure to remove sufficient of the capsule for the presentation of the lens, I have had a DeWecker's scissors constructed with a forceps' tooth at the point of each blade in the hope of securing a better grasp upon the capsule as the blades begin their incision. Sufficient opportunity has not yet presented itself to clearly demonstrate whether this instrument has any advantage over the standard scissors.

ON A PLASTIC OPERATION ON THE EYELID BY MEANS OF A FIBROUS CARTILAGE FLAP.*

By Dr. W. Meisner.

(From Professor Dr. E. Krueckmann's Clinic at Koenigsberg.)

Translated by Adolf Alt, M.D.

In the following I wish to report shortly on a case of cancroid of the lower lid, the treatment of which may be of some interest from a surgical as well as from an anatomical standpoint.

On July 10th, 1908, a woman, 72 years old, came to the eye-clinic at Koenigsberg on account of an ulcer on the right lower lid which, she stated, had been in existence for a year and half and had slowly grown in size.

*Klin. Monatsbl., July, 1910.

It was a typical skin cancer. Commencing at the juncture of skin and mucous membrane, it reached downwards for 4 to 5 mm. Its length corresponded to the middle three-fifth of the lid margin, so that medially near the lacrimal punctum and laterally near the angle a few mm. of the lid margin appeared to be free. It was ulcerated in its whole extent and the centre was covered with a scab. Its margins were here and there, especially downwards, undermined, but not irritated and infiltrated. It was firmly adherent to the underlying tissues. The conjunctiva was normal.

There were no particular eye affections. The visual acuity was one-half the normal (slight arteriosclerosis of the choroid and diffuse rarefication of the pigment epithelium, especially in the regions of the papilla and fovea). Nothing abnormal was found elsewhere, especially no swollen glands.

Since the patient appeared bodily and mentally perfectly strong and desired to be cured, something had quickly to be done to combat the malignant growth. We could not persuade ourselves to treat her with Roentgen- or radium rays. Although very fine results have undoubtedly been obtained with Roentgen rays in cases of skin cancer, from the surgical side more and more voices arise which deny a radical cure of epithelial growth by them and report relapses which arise from the deeper parts in spite of a clean covering with skin. Moreover, we thought that in spite of all precautions it would be dangerous to let these rays exert their influence in sufficient strength on parts which lay so close to the eye. I refer to Birch-Hirschfeld's[6] experiments on the action of Roentgen rays on rabbits' eyes. He saw after the use of rays in such strength as would be necessary for therapeutic effects not only severe inflammations of the conjunctiva and cornea, but, also, severe degenerative changes in the ganglion cells of the retina. While the former affections could be cured, the nervous affections remained incurable and led sooner or later to an ascending atrophy of the optic nerves. He reported at the same time 4 cases in which he had similar experiences in man. They were skin cancers in the immediate neighborhood of the eyes, very similar to our case, and in spite of careful covering of the eye with plates of lead and tinfoil the use of the Roentgen rays led to the same changes as had been caused experimentally in rabbits. Birch-Hirschfeld's statements have not remained undoubted; especially in France and America affections of the retina due to Roentgen rays have not been seen. Yet, we

thought it too dangerous before this point was definitely settled to experiment with Roentgen rays on our patient.

An attempt with radium, too, seemed out of place, because the rays which alone are of importance in the treatment of malignant tumors (γ) are considered to be related to if not identical with the Roentgen rays. Although the alterations produced experimentally in eyes by radium rays are not as severe as with Roentgen rays, their action on the tumors is in the same measure less decided and lasting. In our clinic we have seen several cases in which cancers on the lid and nose had been carefully but thoroughly treated with radium because the patients refused any surgical interference. In spite of an apparent cure the scars broke open again and again, so that in one case at least we had finally to operate. In the other cases this was absolutely refused.

The question in our case was how to form a new lower lid. It seemed to us that Buedinger's method, which of late had been advocated on account of its lasting effect, would with a slight modification be the most appropriate in our case.

Buedinger[1] closed the lid defect by means of a flap of fibrous cartilage from the patient's ear by introducing a piece of cartilage corresponding with the piece of tarsus removed.

His method, in short, is the following: On the anterior surface of the helix region a piece of skin of the desired size is cut, then the knife enters the adjacent cartilage to half its thickness and thus the anterior half is split off from the posterior one. The helix thus being cut in two layers of equal thickness the anterior one and the skin are lifted off together. This flap is used in two ways, as I shall detail here, since I have nowhere found an exhaustive description.

The helix cartilage always replaces the tarsus defect but the skin is used in different ways. In the one the hairless thin skin is to replace the conjunctiva. In this case the flap is put into the gap in such a manner that the raw cartilage surface looks forward where it can be covered by a skin flap taken from the neighborhood of the eye. This is the original method of Buedinger. This was warmly recommended by Birch-Hirschfeld[2,3] who used it without exception.

In another way the flap may be made to form the outer surface of the lid. In this case it is necessary that the conjunctiva of the fornix and of the lid has at least in part been saved. Here, also, the cartilage replaces the tarsus, the ear skin, however, the outer lid skin. Two such cases have been reported by Knapp[4] in cases of loss of a lid by a trauma.

A third and very simple variation has been described by Elter and Has.[7] This was introduced by Miller of Rostock and made use of in our case.

On July 15th, 1908, under local anæsthesia the ulcer was all round circumcised in the healthy tissue and removed. Thus the lid and conjunctiva were removed from the lacrimal punctum to the outer angle. At first we thought the punctum could be saved, but it proved later on impossible.

From the helix of the left ear a wedge of similar shape but larger than the removed lid portion was excised through the whole thickness of the ear so that the cartilage was covered with skin on both sides. This wedge was at once inserted into the gap so that its anterior surface faced the eyeball. The wound lips were most exactly united with the skin of the face and the conjunctiva by sutures. The eye was closed, smeared with boric ointment and covered with sterile gold beater's skin. Binocular bandage. The wound in the ear was stitched and healed promptly. When on the second day the bandage was removed the inserted piece was swollen and of a bluish red color. Two days later it was a pale rose color and remained so. Eight days after the operation the sutures were removed. The implanted piece which at first was considerably thicker than the preserved parts of the lid shrank gradually so that after 6 weeks it was on a level with them.

Seven weeks after the operation a gray, glassy, tough nodule of the size of a pinhead was observed in the lacrimal punctum and an excised piece proved it to be carcinomatous. On September 7th it also was removed. The part now cut out contained a portion of the ear cartilage implanted seven weeks previously. The new wedge shaped defect was perfectly covered by undermining and sliding over it the neighboring skin. Yet, in the course of a few weeks the nasal part of the lid became ectropionized. This was corrected by tarsorrhaphy and shortening of the palpebral fissure.

When the patient was discharged 4 months after the first operation the right lower lid looked very much like the left one. When the eyes were open no ectropion was apparent, the lids closed easily and there was no lagophthalmus. On closer inspection the outlines of the implanted flap were shown by fine linear scars and at the lid margin the cartilage could be felt as a hard resisting body. Cornea and conjunctiva had never been irritated.

Four months are, of couse, a short period and a more prolonged observation will be necessary in order to judge the case and the value of the operation rightly. We kept the case, therefore, under surveillance and had the patient return at intervals. Yet from November, 1908, till November, 1909, that is in one and one quarter year since the first operation, the conditions have remained unaltered. No relapse of the carcinoma has occurred, the cartilage has not shrunken further, and we may assume that the present condition will be a lasting one. (A further examination in May, 1910, showed no further changes.)

On November 5th, 1909, the right eye appeared quiet, no corneal opacities or infiltrations; media and fundus as before. The right lid even on close examination shows nothing abnormal. It measures in the middle part from fornix to lid margin about 4 mm. and is well adapted to the eyeball. At its upper margin corresponding to the position of the cartilage a hard strip reaching downwards for about 2½ to 3 mm. can be felt, which is the ear cartilage. The function of the lid is perfect. In closing the eyeball is perfectly covered.

The little excised piece containing cartilage and carcinoma was fixed in formol (Sept. 7th), hardened in alkohol, embedded in paraffin and cut in sections vertically to the lid margin.

Examination proved that the carcinoma had been removed surrounded everywhere by healthy tissue.

The condition of the different tissues in the transplanted piece was of especial interest. The histological processes which after transplantation take place in the transplanted piece as well as in the neighborhood have been repeatedly studied. On animals, too, these processes have been studied experimentally. Yet, nobody is likely to dispute Garré when he states it to be the ideal to study these changes in man. From all the accidentally gained tissues and aided by the experiments on animals we may finally get at the correct explanation. Our case offered an extraordinarily favorable occasion. The patient was demonstrated in the Koenigsberg *Verein fuer wissenschaftliche Heilkunde* by Professor Krueckmann and the peculiarities of the case were pointed out in the microscopical specimens.

Based on numerous experiments of his own and with critical sifting of the studies of others, Marchand[5] in his book on "Wundheilung" (healing of wounds) has given us a comprehensive description of what is known about transplantation. With the aid of this book it seems best to consider the changes in the epithelium, connective tissue and cartilage separately.

A nearly unanimous opinion exists concerning the fate of transplanted epidermis. The most superficial layers of the transplanted epithelium slough off, since in the natural condition even they are doomed to die soon, yet of the cells of the deeper layers of the rete malpighi many are preserved and from these as well as from the preserved glandular ducts a rapid regeneration of the surface takes place. The epithelial elements from the surrounding healthy tissue take an active part in this. These changes may be studied even macroscopically when the parts are rebandaged. It is then not at all rare to see, how from the edges a delicate epithelial margin grows gradually forward over the transplanted flap and how after the superficial epidermis layers of the flap have been cast off a new delicate cover has been formed. The same changes as are observed with Thiersch flaps take place with non-pedunculated flaps as in our case. They are well known and we here simply mention them in short.

Opinions differ materially as to the behavior of the subepidermal tissue, that is the cutaneous and subcutaneous tissue.

Enderlin, for instance, says that the transplanted connective tissue disappears altogether and is replaced by new tissue growing from the surroundings. Brown, on the contrary, thinks that all of the cutis elements continue alive. Most of the observers (Garré and Golden, Henle, Marchand) maintain that in this tissue, too, the changes are analogous to those in the epidermis. Even with a successful operation always a part of the tissue dies, yet the degree of degeneration varies in different cases. A definite knowledge can probably be gained only when elective tissue stains have been found.

We now come to the cartilage the use of which for replacing the tarsus is the important point in this operation. Its behavior has, also, been studied experimentally. In surgery cartilage has been repeatedly made use of for filling in defects where connective tissue would not furnish the required stiffness and where bone was considered out of place on account of its hardness and resistance. I may here remind the readers of F. Koenig's plastic operations on the nose and larynx.

The behavior of transplanted cartilage seems to depend on different conditions. There is quite a difference between cartilage from the embryo and that from the adult, and also, whether it is transplanted with or without the perichondrium.

The oldest report, as far as I can find, is by Zahn, who implanted pieces of cartilage without perichondrium in the same

animal from which they were taken. This cartilage underwent a fatty degeneration and was absorbed after a short time without having shown any proliferation. When Zahn used foetal cartilage the pieces lived and grew in the new place (for instance the kidney).

Similar results were obtained by Fischer and later on by Birch-Hirschfeld and Garten.[9] They saw growth and even new-formation of cartilage in embryonic cartilage transplanted into liver or lung. Later on, however, all of this disappeared again.

Helferich experimented on young rabbits and transplanted cartilage and bone from the extremities in a reversed position in the same place. He found great shrinking of bone and cartilage and besides a decided proliferation which, however, took its origin from the periosteum or perichondrium.

Henle studied the behaviour of transplanted cartilage in Mikulicz' clinic. He cut an oval piece of skin and cartilage from the inner side of the rabbit's ear and either stitched it back into place in the same ear after having reversed it or he exchanged it with a similar piece taken from the other ear. The wound was then closed by sutures and the changes occurring in the transplanted piece were observed at regular intervals. He never saw a very great degeneration in the cartilage. Nearly always the transplanted cartilage appeared like the normal one. Whenever Henle found shrunken cells in the transplanted cartilage he found them, also, in the surrounding cartilage. When there was a gap between the two cartilages proliferation occurred from both their margins. When they overlapped each other the proliferation took place at the points of contact and not at the free edges, just as happens in fractures of bone. In these experiments the cutis elements, also, were preserved. In one case only the healing process was disturbed and a cell infiltration was observed in the cartilage. Henle concludes that transplanted tissue can continue to live and that cartilage implanted in cartilage does persist.

The conditions in Buedinger's operation are somewhat different from these experiments. Therefore, the results also differ. The main difference lies in the fact that the ear cartilage was transplanted into a region which in the norm contains no cartilage. The transplanted cartilage, therefore, did not come in contact with a homologous tissue. Whereas in our case the whole thickness of the lid has been removed the wound surfaces of the cartilage are everywhere in contact with the connective tissue of the

subcutis. Where a portion of the lid has been preserved the cartilage comes in contact with the tarsus, which is, also, a lamellated fibrillar connective tissue.

As far as I know, the histological processes in transplanted cartilage in man have as yet not been studied. Birch-Hirschfeld[2] reports only on microscopic studies in rabbits.

The histological examination of the implanted cartilage (stained with Von Giesen) gave the following results:

In our case the transplanted piece seven weeks after the operation had on the whole preserved its form; but the cells and the matrix of the cartilage showed a different behavior in different parts.

The conditions are best in the neigeborhood of the lid margin. Here the cartilage cells lie densely packed and almost in regular rows. The nuclei are well stained, the matrix is sparce. Mitotic figures cannot be found; there is, therefore, no proof of a newformation of cartilage cells. This may be due to the length of time which has elapsed since the operation. At any rate the cells are numerous.

The picture is decidedly different on the side where the cartilage is in contact with connective tissue. Here the spaces between the nucleated cartilage cells are much larger and there is no arrangement in dense rows. There are holes in increasing numbers in the fibrous pale greenish colored matrix containing no cells. These cannot be explained by the fact that the microtome left the nucleus untouched. A similar picture is found in the interior of the cartilage near the wound surface. The most pronounced pathological changes are found at the base of the cartilage. Here but few nucleated cartilage cells lie here and there in the pale green interstitial tissue and most of these show signs of degeneration in their protoplasm and nuclei. Moreover, the marginal parts show a vivid invasion of newly formed connective tissue. The young cells and fibres penetrate everywhere into the cartilage tissue and to a certain extent replace it. In one place a capillary bloodvessel has grown far into the cartilage and is surrounded by much new connective tissue. The capillary is seen to turn towards the scar margin from where connective tissue grows towards it. . . . .

. . . . From this we see that the behavior of the cartilage differs in different parts. This is easily explained. Former experiments have shown that adult cartilage, transplanted without perichondrium, was absorbed without showing any proliferation. On the other hand cartilage with perichondrium persisted for a

long time. This explains the behavior of the different parts of the cartilage in our case. The helix of the ear (the lid margin in our case) is best supplied with perichondrium. This part is surrounded upwards, frontwards and backwards by perichondrium. Here, also, the cartilage is thinnest. Farther on on the surface of the ear the cartilage is much thicker and has perichondrium on one side only.

Even under normal conditions the inner side of the cartilage has a poorer nutrition than the surface.

The cut edges of the cartilage are absolutely devoid of perichondrium. They border on the fresh wound surfaces of the excised eyelid and have had to stand the traumatic insult. In consequence we find the most visible signs of degeneration just here and the cartilage cannot oppose sufficiently the invasion by connective tissue.

For comparison's sake a small strip of the ear cartilage was microscopically examined fresh at the time of the operation. It gave a perfectly normal picture, being very rich in nucleated cartilage cells arranged in rows and having a comparatively small quantity of intercellular substance. We can, therefore, assume that the changes in the cartilage detailed above are due to the operation and its consequences and not to the age of the patient.

If we reconsider shortly what we have found we must arrive at the following conclusions:

The transplanted cartilage, implanted with skin and perichondrium in another place of the same individual where it does nowhere come in contact with homologous tissue, has healed in per primam without any disturbance in the course of healing. In spite of this it is not preserved in toto and shows seven weeks after the operation nearly normal conditions only in the parts which were covered with perichondrium. In other places a degeneration and slight resorption has occurred, which is more diffuse in the centre of the cartilage, but more intense and more localized at the wound margins. In these parts the gaps are in part replaced by connective tissue, while in the interior we must assume that the preserved cartilage cells are pressed closer together. Yet, the replacing with connective tissue at the wound margins progresses apparently so slowly and is without much shrinkage so limited to their neighborhood that the shape of the transplanted piece, while it is somewhat smaller, is in general macroscopically and microscopically unaltered.

Thus this modification of Buedinger's operation is justified. Professor Krueckmann has performed it during the last two years in three other cases with perfect success. As in all similar plastic operations, so in this it is necessary to work as rapidly a possible, in order not to disturb the nutrition unnecessarily.

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A METHOD OF DETERMINING OCULAR DOMINANCE.

A. C. Durand and George M. Gould (*Jr. A. M. A.*, July 30, 1910) describe a simple instrument for determining the dominant eye. It is made by taking a piece of black card board, a foot long and six inches wide, cutting a round hole in the center of it exactly the size of a pasteboard mailing tube and inserting into this hole a piece of tube four inches long and fastening it there by applying glue around the joint on both sides of the card board. This essentially constitutes the instrument, but for convenience a handle is attached by taking a piece of the tube eight inches long, cutting slits in the end just large enough to slip the pasteboard card into them and cutting crescent shaped segments from the end of the handle so that it will fit around the tube inserted in the hole of the cardboard. Putting the handle in place it is glued at all the joints and the instrument is complete except that it should be blackened. In making the test a white disc is hung on the wall on a level with the patient's eyes and he is directed to look at it through the tube in the instrument, held at arm's length, having both eyes open. It being impossible for him to look through the tube with both eyes at once he will naturally use the eye with which he is accustomed to see things best. If he looks with his right eye and the left eye is covered with a card he still sees the disc, whereas if the right is covered he only sees the screen of the instrument. Reference is made by the author to the importance of oculists being careful in prescribing glasses for patients lest they compel a naturally right-eyed person to become left-sighted.

MEDICAL SOCIETIES.

OPHTHALMIC SECTION,
ST. LOUIS MEDICAL SOCIETY.

Meeting of October 5, 1910.

Dr. F. L. Henderson, presiding.

Intra-ocular Cysticercus, with presentation of one specimen and one case.—Dr. Carl Barck.

During my practice of over 25 years, I have seen two cases of intra-ocular cysticercus.

The first one came under my observation about 25 years ago. When seen in 1889 the entozoon was already free in the vitreous. The media were still fairly transparent and the movements of the scolex were plainly visible. It was located very far back, close to the posterior pole. At that time I had constructed an ophthalmoscope to be used as a head mirror, with the view to operate under illumination of the fundus. But I found this method to be absolutely impractical, as others have experienced before and after. I then attempted to remove the cysticercus after the generally accepted method of Albrecht (the younger) Graefe, i.e., through a scleral section. The effort was unsuccessful. The case then took the usual course: Increase of cloudiness of the vitreous, chronic irido-cyclitis and shrinking of the eye-ball. It was more than a year later when the patient consented to the enucleation.

The specimen which I am passing around, had been hardened in Mueller's fluid. It shows the vesicle in the vitreous. The scolex is not visible in the section. The size of the vesicle is 3 by 4 mm.

The other case was first seen during my absence by Dr. Clarence Loeb. The patient stated that he had been struck in the eye with a base ball, early in June. The eye was swollen and discolored for 11 or 12 days. On about the 21st of July he noticed, that he could not see well with the left eye, in the lower outer portion of the field. He consulted Dr. Loeb on the 25th of July and the diagnosis of detachment of the retina was made. The patient was put on the usual treatment and kept at the hospital

for about three weeks; then he was treated in his home. The central vision was always normal. Under the treatment a temporary improvement took place, so that the scotoma had nearly disappeared.

When I saw the patient on the 3rd of September, the fundus was normal with the exception of the superior nasal quadrant; here the retina was somewhat discolored and it seemed, as if a rent had taken place. No detachment was visible any longer. The area of discoloration was located about midway between the horizontal and the vertical meridian and anterior to the equator. Vision =6/6, Snellen I. The outlines of the fields of vision, as you will see from the chart, were normal; but in the outer lower quadrant there was an area about three times the disc-size, where the vision was not as distinct as in the remainder of the field. This area is indicated by the shaded portion on the chart. But the perception in this portion improved during the next weeks, until the 21st of September. On this day the patient returned with the statement that his sight had become worse again.

On examination a round bladder-like detachment of the retina could be seen in the old site, from which a green-blue trunk projected. A provisional diagnosis of intraocular cysticercus was made. After repeated examinations the diagnosis became certain. The head and the neck of the scolex could be clearly distinguished; furthermore, movements could be seen at times. Within the following week the scolex seemed to grow; and at the end of this period it appeared to be about twice as long and somewhat thicker, than when first seen.

On the 1st of October, some projection was noticed, which looked like a second scolex. It was situated somewhat below and more peripherally than the first one. During the last days the two heads could be distinctly seen by myself as well as by a number of colleagues. The new one appeared to be about half as large as the old one.

For operative purpose I tried to make an exact localization. As is well known, Graefe had an instrument constructed, more than 30 years ago, which he called localization-ophthalmoscope. It consisted of a small perimetric arc, attached to the opthalmoscope, which could be rotated. As this instrument proved impractical, Graefe abandoned it very soon. A much better method is to locate by means of the perimeter, provided that the central vision is still good enough to permit the patient to fix. If the affected area is not too far distant from the macula lutea, the patient fixes the center of the perimeter, whilst the examiner finds

with the ophthalmoscope the position, which brings the affected area of the fundus into his line of vision, and reads then the meridian and the degree of his position off the perimeter. But if the affected area is near the equator or in front of it, the examiner has to assume an awkward position; then it is advisable to let the patient fix an excentric spot on the perimeter instead of the center. In my case I brought the cysticercus straight into the line of vision, when the arch of the perimeter occupied the meridian 45°, the patient fixed a mark on it at 40° above, and the position of my eye was at 60° below. The difference of 100° gave the position of the animal somewhat (10 degrees) anterior to the equator in the mentioned meridian. Repeated examinations gave the same result. The field of vision, taken a few days ago, shows a contraction of the outer and lower portion, the details of which you see on the chart.

The first cysticercus in the eye was observed by Soemmering in 1830. Its seat was in the anterior chamber. The first case with the seat in the vitreous was seen not long after the invention of the ophthalmoscope, namely by Coccius in 1853. The location in the vitreous chamber is much more frequent than in the anterior chamber. Up to 1900, there appeared 36 communications on cysticercus in the anterior against 194 in the vitreous chamber. Of these 230 reports, 9 only came from the United States; one giving the location of the entozoon in the former, the other eight in the latter. This shows the scarcity of this disease in our country. The region, where the disease is most frequently encountered, is a portion of northern Germany, which embraces the cities of Berlin and Halle. A. v. Graefe and Hirschberg in Berlin and Alfred Graefe in Halle saw, during a certain period, up to a half dozen cases a year; the statistics of their immense material gave quite uniformly the ratio of 1 to 1000 cases. But in the last twenty-five years the frequency of the disease has rapily decreased, especially in Berlin; a later statistic of Hirschberg gives the ratio as 1:23000. This favorable result is one of the achievements of preventive medicine; it was partly due to the rigid meat inspection and partly to the enlightening of the public by the profession as to the danger of consuming raw meat. Next to northern Germany, France and Italy are the countries most infested; in England, Holland, Austria, southern Germany and Russia, the affection is rare. Isolated cases have been reported from every part of the globe.

The natural history of the cysticercus is, in many points, not fully clear. The supposition is, that if the egg of the tænia

solium comes into the stomach, the gastric juice dissolves its envelope and the embryo becomes free. It then pierces the walls of the stomach, finds its way into one of the bloodvessels and is deposited in different organs, amongst them the eye. In the minority of cases only, was the carrier of a cysticercus the host of a tape worm; we must therefore admit the possibility, that the eggs of the tænia reach the stomach directly, being introduced with the food. After the embryo has nested somewhere, it grows and forms at first a minute vesicle, or bladder, not larger than the head of a pin; this increases in size and later on, the so-called scolex develops from some part of the wall. This is at first invaginated and afterwards becomes evaginated. The scolex then projects like a trunk; it consists of a neck and a thickened head. Around the head there are four suckers and inside of these a circle of hooklets, which later are visible under magnification only. The vesicle is semitransparent and it shows especially around its edges and in the scolex iridescent colors. When alive, movements and peristaltic contractions take place more or less frequently. The average size of a developed cysticercus ranges from 6 to 10 mm; the largest one on record was observed by Hirschberg; it measured 15 mm.

The cysticercus is the larva of the tænia solium and is found in pork; the echinococcus is the larva echinococcus and infests the beef. But, whilst echinococci are found quite frequently in the most different organs of the human body, there are only two indubitable cases of echinococcus in the vitreous chamber on record. Greef and Parsons agree on this point.

Colored pictures of intra-ocular cysticercus are only given in the earlier atlases of ophthalmoscopy. The oldest one is in Jaeger's Atlas; a case of subretinal cysticercus. In Liebreich we find two pictures; the most conspicuous of these has been extensively copied in the different textbooks. The atlases of Moeller, Haab and Frost do not contain any. The latest original picture is published in the new Graefe-Saemisch.

The intra-ocular cysticercus is, as a rule, solitary. There are about half a dozen cases on record, where the eye contained two, and in one instance three of the parasites. In some of them the primary nest may have been mistaken for a second individual. But Graefe found two cysticerci in an enucleated eye, and Cohn, after removal of an eye, from which he had extracted one previously, found that it contained a second one. It is therefore possible, that there are two parasites in the eye of our patient, and I welcome your opinion on this point after your examination.

The nest of the entozoon is at first subretinal; after it has reached a certain size, it pierces and leaves the retina through a rent and is finally found free in the vitreous. These three stages of development; subretinal, in the vitreous, but still adherent to the wall and freely moving in the vitreous, are also quite important for practical purposes and determine the method and the prognosis of our operative procedure.

This brings us to the treatment, which I mention only briefly to-day. At first the different anthelmintica were tried, without result. The older Graefe initiated operative procedures. He conceived at one time the idea which has been revived of late, to destroy the parasite by injections or by instruments. But the deliberation, that even the dead animal might exert a detrimental influence upon the eye, caused him to abandon the attempt. Then he resorted to extraction, and was successful in some instances. His method was extraction through the pupillary area, after a preliminary iridectomy and removal of the lens. For the classical method, which is now generally accepted, we are indebted to Alfred Graefe. Briefly speaking, this is the scleral section. After a careful localization of the cysticercus a triangular flap of the conjunctiva is dissected back with or without detaching the tendon of one of the external recti muscles. Then the sclera and choroid are incised and the parasite is removed. On the detail of this procedure and the results I will dwell when reporting the outcome of this case. I would have operated sooner, but on account of the infrequency of this affection in our country, I wanted to present it to this society. During the few days of delay the condition did not change, and I shall operate it in the nearest future.

DISCUSSION.

Dr. Clarence Loeb had not heard the earlier part of Dr. Barck's paper, and hoped he would be pardoned if he repeated what Dr. Barck had said. He had seen the case first on the 26th of June. The patient stated that for a week he had noticed a shadow over to the right side. At that time he gave no history of trauma. Later he mentioned that fact. There was no pain and no injection. When the vision was taken the first time, there was almost total loss of the lower right quadrant. He was sent to the hospital and put on eliminatives. At that time there was detachment of the retina. On the 3rd of August there was no trace of the detachment of the retina and the visual field was almost completely normal, though there was slight contraction

in the lower quadrant. On the 12th of August he left the hospital but on the 16th he returned to the office, saying that the eye was as bad as it had ever been. There was slight contraction of the field of vision but ophtha'moscopically the picture was about what it was at the present time, i.e., it looked as though a vesicle had ruptured leaving the remains of the sac. He was again put to bed with dionin in the eye and K. I. internally, but it seemed to have no effect. Around the area of the ruptured vesicle the retina seemed slightly detached. On the 30th Dr. Barck had returned and the patient was then turned over to him, and Dr. Loeb had thought no more of it until Dr. Barck had told him his diagnosis. He had been looking over the literature and in contradiction to what Dr. Barck had said as to the unusual number of cases in Berlin, he had noticed one article in the Zeitschrift für Augenheilkunde, 1908, in which more cases were reported from Russia and Italy. One author reported five cases in Italy and there were two reported in Russia in the same year. Another article reported a case of cysticercus treated by incision into the sclera, the positive electrode was introduced and the cysticercus was destroyed. Another article reported good results from the intraocular injection of a weak bichloride solution. There was almost immediate restoration of vision. One author had stated that cysticercus acted as an aseptic foreign body, causing detachment of the retina and thus producing loss of sight of the eye.

Dr. Meyer Wiener, referring to the fact that Dr. Barck had said that this condition was very frequent in Berlin, said that he had been told by one of the physicians in the largest clinic in Berlin that he had never seen a case.

Dr. Julius Gross asked Dr. Barck if he would not try some other method before enucleating the eye?

Dr. Frank Henderson asked Dr. Loeb how he explained the disappearance of the retinal detachment and then its reappearance.

Dr. Loeb thought that there had been a subretinal serous effusion and that the cysticercus was too small for him to see it. Later it grew larger and became visible.

Dr. Barck wanted to add a few words to what Dr. Loeb had already said. He thought, that there might have been some serous exudate, which caused a large detachment of the retina. He believed, that at the time the vesicle was very small, then rupture took place and a portion of the retina became reattached.

As to the size, the vesicle was about as large as the optic disc. The disc has a diameter of 1½ mm.

He gave it as his impression that there was a second parasite in the eye smaller than the one seen first.

As to the cause of the infrequency of cysticercus in our country, this was without doubt due to the fact, that the habit to consume raw meat is very rare here. In Germany not only cases of cysticercus, but of echinococcus as well, have diminished enormously in frequency, since the public has been enlightened on the danger of raw or insufficiently cooked meat.

Dr. Luedde asked Dr. Barck if there was anything in the history of the man to which he could attach any explanation of this condition. He would like to know something more of the proposed plan of operation, and what size he expected this thing to be when he cut into the sclera.

Dr. Shahan said with regard to non-operative measures a case was reported by Dianoux in the early part of the year in *La Clinique Ophtalmologique*, in which a man of 31 years, affected by a tape worm, and with cysticercus of the skin, of the eye (in the vitreous) and of the nervous system (as shown by epileptiform crises) was treated for two months—with frequent intermissions—with extract of male fern. The final result reported was the death and absorption of the cysticercus in the vitreous and cessation of the other symptoms. Similar results had been reported by Prof. Renzi of Naples.

A second case was reported to the *Société D'Ophtalmologie de Paris* by Dupuy-Dutemps last March, of a subretinal cysticercus in the region of the macula. Operation was attempted after the failure of the use of male fern (the length of time used was not stated). The first operative attempt was a failure. Two months later a second attempt was made. This time the cysticercus, which measured about 4x6 mm. popped out suddenly without rupture of the vesicle, and the eye made an uneventful recovery with vision of about 1/50.

Dr. John Green, Jr., said that he would like to have Dr. Barck in closing dwell a little on the operative procedure he proposed to make.

Dr. Barck did not know, whether any of these procedures should be recommended. The method of getting rid of a cyst by the use of injections of iodine had, as a general rule, been abandoned. Most of these cases were now removed by operation and he was not sure but an operation was safer than the injection of any of these substances in the vitreous. But even sup-

posing that one could kill the cysticercus by the injection, there would still remain a foreign substance in the eye; the effect of which was unknown. The results of the removal were quite good. They were about 60 to 70 per cent. in cases where the cysticercus was not free in the vitreous. Those which were subretinal and those adherent to the walls gave a better prognosis than those free in the vitreous. Those operated upon by the old method of A. von Graefe were not as satisfactory as the ones operated by the scleral method, introduced by his nephew, Alfred Graefe. The procedure was to remove a triangular flap of the conjunctiva, so that the sclera was perfectly bare and then to rotate the eye as far to the opposite direction as possible. When the cysticercus was located very far posteriorly, it was necessary to sever one of the muscles, in order to rotate the eye far enough. When subretinal, the cysticercus simply came out through the section without much manipulation. In these instances the section leaves the retina intact. In cases, where the animal had penetrated through the retina and was in the vitreous, there was necessarily more or less loss of vitreous. For extraction different instruments, as hooks, forceps, spoons, etc., had been used. When the cysticercus was free and moveable, it was of course a fishing in the dark and the prognosis was far less favorable.

Enucleation was only indicated, where the case was seen, after the eye had become blind, or where the operator had failed to extract the parasite. He would like to have the opinion of the Society, as to whether any one recommended, to try to destroy the animal by injections or by galvano-puncture, before operating with the knife. These methods did not appeal to him for the reason that a foreign substance would be left in the eye.

Dr. Henderson asked if there were any reported cases of sympathetic ophthalmia resulting from the uveitis produced by the cysticercus.

Dr. Barck said that there were such cases reported; but only where operations had been performed.

The LaGrange Operation: Report of a case.—Dr. N. M. Semple.

The question of the relative value of the operative and the medicinal treatment of chronic non-inflammatory glaucoma is always an interesting one. I reported to the Ophthalmic Section of the American Medical Association (meeting of 1908, Chicago,) a case which had then been under observation for over five years. Here on one eye an iridectomy had been performed, while the

other eye had been under the constant use of the oil solution of eserine, producing an uninterrupted miosis. Up to the present time (1910) the iridectomized eye has retained the same markedly improved condition, both of the central visual acuity and the extent of the visual field which followed the operation. In contrast to this, the eye under the miotic has steadily lost, until at present there is practically no vision. In this case there was no positively demonstratable increase of the intraocular tension.

The case which I report to-night is one of like character, except in that there were periods of decided increase in tension (+1.), accompanied by a rapid failure in vision. There was no history of any inflammatory attack of any kind. At the time of the first examination, the right eye could count fingers at about ten feet, left eye at five feet. An accurate determination of the visual fields was not made, as the patient was still in bed recovering from a previous rectal operation. A rough test showed the fields of both eyes markedly contracted on the nasal side, more so in the left eye.

On May 4th, the combined iridectomy and sclerotomy was done, following as closely as possible the method suggested by LaGrange. The immediate recovery was normal. On September 2nd, the examination of the operated eye showed the vision to be 20/38 (with the following correction +1.5 sph.+1.5 cyl. ax. 135°). The vision of the right eye, in which the oil solution of pilocarpin had been faithfully used in sufficient strength to produce perfect miosis, had decreased to the counting of fingers at one foot, while the nasal portion of the field was entirely gone. It is too early to make any claim as to the permanency of the result in the left (iridectomized) eye, but the rapid loss of vision in the right eye, despite the faithful use of a miotic and which had produced perfect miosis, is in most striking contrast to the so far most excellent result obtained in the other eye by the LaGrange operation.

The possible permanency of a filtrating scar seems to be contradicted by the animal experimentations of Henderson. Yet I have one case under observation where such a scar has persisted for over seven years—so far as can be positively stated from clinical observation. From the theoretical anatomical standpoint, I see no reason why the endothelium of Descemet's membrane cannot grow into a scar formation in a manner analogous to the original formation of the ligamentum pectinatum with the spaces of Fontana and the canal of Schlemm.

DISCUSSION.

Dr. Meyer Wiener said that it might be interesting to report to the members, that the LaGrange operation done by Dr. Greenwood at the meeting of the A. M. A. had proved quite a success. This patient had a chronic simple glaucoma. She had been gradually, slowly and surely getting worse. Since the operation the fields were slightly larger and the vision had improved somewhat, whereas before the operation it had slowly but surely deteriorated, though eserine had been thoroughly used.

Dr. Green asked Dr. Semple what sort of scissors he used in cutting off the flap. The point which had particularly impressed him in the LaGrange paper was that he recommended a pair of scissors curved like a semi-circle.

Dr. Semple said that he had used the ordinary Stevens' scissors. After making a deep cut with the Graefe knife, bringing it out quite a distance from the corneo-scleral margin, with the ordinary curved tenotomy scissors of Stevens, he had cut off a good lip of the sclera. He could see an advantage, but not a necessity, in having the scissors especially curved.

ABSTRACTS FROM MEDICAL LITERATURE.

By J. F. Shoemaker, M.D.,

St. Louis, Mo.

THE STATUS OF VACCINE AND SERUM THERAPY IN OPHTHALMOLOGY.

John E. Weeks (*Jr. A. M. A.*, July 23, 1910) says that in "active" immunization, that is where substances are introduced into the body that will cause the tissues to form antibodies, the questions of importance to decide are first, the condition of the individual as to whether his tissues are capable of responding to the stimulus of these substances, or antigens, and second, the proper dose to administer. The introduction of an antigen is useless or even injurious where the tissues are so much exhausted that they cannot respond to the stimulus it normally would produce; and upon the proper estimation of the dose depends the desired results. In "passive" immunization, that is where antibodies that are already formed are introduced into the body, the problem is only how much of the antibodies is neces-

sary and what amount the tissues will tolerate without injury.

Substances which produce "active" immunization are called vaccines, or bacterins, while "passive" immunization is produced by the use of serums. Weeks discusses tuberculin, gonococcic vaccine, streptococcic vaccine, staphylococcus vaccine and Coley's toxin in relation to ocular therapy. He gives briefly the processes by which Koch's original tuberculin, "T. O.", Koch's new tuberculin, "T. R.", Bacillus emulsion, "B. E.", and Bouillon filtrate, "B. F.", are obtained. In the treatment of ocular tuberculosis "T. O." is used very little as its value is greatly impaired by the high temperature to which it is subjected in its preparation. "T. R." and "B. E." are of more value while many think that "B. F." is of most value. Tuberculins are prepared from both the bovine and human strains of the tubercle bacilli. If the strain can be determined in any given case of tuberculosis of the eye the tuberculin prepared from that strain should be used, if not, either one may be used separately or both combined. The von Hippel method of treatment is found to be best and is recommended by those of large experience in this kind of therapy. This method is to begin with very small doses, not more than 1/500 mg., and increase by 1/500 mg. each dose, given every third day, providing no general reaction occurs. If there is a reaction the dose should not be repeated until the temperature has returned to normal and remained so for at least forty-eight hours. The dose should be so regulated that the effect is just short of the general reaction. As the patient improves the dose should be given less frequently.

Gonococcic vaccine promises to be of some value in determining the cause of obscure cases of uveitis, iritis and metastatic conjunctivitis since a reaction is often obtained in cases who have gonorrhœa that does not occur in other cases. The reaction consists of an elevation of temperature, general malaise, and local tenderness at the site of injection. This vaccine has been found of very little value in acute gonorrhœal infection either of the urethra or of the eye. However, the evidence on the subject indicates it is of material value in chronic gonorrhœa.

The streptococcic vaccine may be of value in the treatment of erysipelas affecting the eye. Some good results have been reported by some observers, but in many cases it appears to modify the course of the disease very little, if at all.

Staphylococcus vaccine made of the autogenous strain, that is from staphylococci obtained from the case to be treated, appears to be much more effective than that obtained from numerous

strains combined, which is termed polyvalent. This is true, indeed, of most vaccines and serums. Reliable observers have reported good results from the use of this vaccine in sluggish, purulent infection of the eye, in chronic hordeoli, and in eczematous conjunctivitis and keratitis.

While Coley has reported very good results from the use of his toxins in quite a number of cases of sarcoma, some other observers, among them a number of ophthalmologists, report negative or unfavorable results from its use. Coley states that carcinoma and melanotic sarcoma are not benefited by its use.

Of the following serums, viz.: diphtheria antitoxin, gonococcic serum, streptococcic serum, tetanus antitoxin serum, typhoid antitoxin, meningitis antitoxin, Deutschmann's serum, cytogenic serums and syphilitic serum discussed by Weeks, diphtheria antitoxin, tetanus antitoxin serum, and Flexner's meningitis antitoxin are, beyond doubt, of distinct therapeutic value. While diphtheria antitoxin is frequently of great value to ophthalmologists, tetanus antitoxin and Flexner's serum as only so to a minor degree, the eye symptoms present in cases where they are employed being of less importance and relatively infrequent. The gonococcic serum, streptococcic serum and cytogenic serums have yet to establish their therapeutic value as the reports on the results obtained by their use have been very variable. Deutschmann's serum seems to give negative results according to most observers other than himself. Syphilitic serum is apparently of great diagnostic value.

THE OCULAR PALSIES ASSOCIATED WITH THE INDUCTION OF SPINAL ANÆSTHESIA BY VARIOUS SOLUTIONS.

WITH A REPORT OF FIVE CASES.

Wendell Reber (*Jr. A. M. A.*, July 30, 1910) reports five cases of palsy of the ocular muscles occurring among 2,000 cases of lumbar anæsthesia induced at the Samaritan Hospital in Philadelphia. Since this method of surgical anæsthesia is being extensively employed he thinks it wise to study this complication and put on record those cases in which it occurs. In two of Reber's cases both external recti were affected while in the other three only one of the external recti was involved, although in one of these three cases there was a partial cycloplegia. Two of the cases recovered completely, one in seven days and the other in six months. In two of the others the trouble persisted as long

as they were under observation and one had been under observation only three days when the report was made. Stovain was the alkaloid used in four of the cases while in the other case tropacocain was used.

Including his cases the author finds thirty-six cases recorded in literature. Thirty-three of these cases showed involvement of the external recti only while two had incomplete ophthalmoplegia externa and one had a paralysis of the superior oblique. Stovain was used in twenty-one of the thirty-six cases, novocain in six, tropacocain in three, cocain and alypin in one each, while in four cases it was not stated which drug was used. The time of onset of paralysis after operation varied from four days to eight weeks, the average being ten days in those cases where the time was noted. Sixteen cases recovered completely among those that were watched, it being eight months in one case before recovery was complete. Five days is the shortest time in which any of the cases recovered. It thus appears that some of these cases are likely never to recover, making this a serious complication of spinal anæsthesia.

Concerning the pathogenesis of these palsies there is considerable difference of opinion. Nuclear hæmorrhages are suggested by some. Inflammation due to stretching or crushing the nucleus or nerve, by others. Others still believe it may be due to certain toxins similar to paresis caused by the toxins of diphtheria. W. Wayne Babcock, who has induced nearly 1,500 spinal analgesias, offers still another theory. In a personal communication to the author he sets forth his reasons for believing that the palsies are due to decomposition or by products resulting from the preparation, especially the boiling of solutions injected. He says:

At the present time, I would draw the following conclusions:

1. We have no positive final proof that pure stovain or tropacocain, when used for spinal analgesia will be followed by paralysis of the ocular muscles.

2. The use of solutions of both stovain and tropacocain may be followed by such palsies and by other symptoms suggesting the presence of associated by products.

3. The palsy may occur irrespective of the use of adrenalin, alcohol, glucose or other admixture, although it is possible that some of these substances may accentuate or favor the undesirable effect.

4. The antiseptic properties of stovain and tropacocain and the fact that in quite a number of instances I have withdrawn

cerebrospinal fluid from one to many days after the spinal analgesia, and have never found the slightest turbidity of cellular exudate, or other indication of inflammatory action, inclines me to the belief that sepsis or a bacterial irritation is not responsible for the ocular palsy.

5. An incidence of ocular palsy in one to 400 or 500 spinal analgesia and the occurrence of frequent headaches should make surgeons very careful to avoid heated or decomposed solutions for spinal analgesias.

6. Spinal analgesia should not be discredited by the untoward effects resulting from decomposition or contaminating by-products. Unfortunately, no Squibb has yet arisen to do for spinal analgesics what has been done for ether and chloroform.

REPORT OF THE COMMITTEE ON COLLECTIVE INVESTIGATION CONCERNING THE OCULAR MUSCLES.

Lucien Howe, Howard F. Hansell and Theodore B. Schneidemann (*Jr. A. M. A.*, July 30, 1910) report concerning the work of this committee during the past year. Special anatomical investigations have been made concerning the "check ligaments," the "secondary insertions" of the recti muscles, and the ophthalmic ganglion. A number of dissections have been made by Lucien Howe and A. C. Durand, demonstrating the check ligaments, which with photographs of the dissections are presented. From these dissections the committee conclude:

1. We should limit the term "check ligament" to that portion of the septum orbitale which extends from the orbit to the globe, which is about as wide as the muscle which lies beneath it, and which is limited anteriorly by the conjunctiva and posteriorly by the connective tissue fibers covering the muscle and adjacent orbital tissue.

2. The check ligaments, especially those over the lateral recti, do distinctly check abnormal action of the corresponding muscles. They do not check, however, any of the physiologic motions of the globe.

Observations have also been made concerning the action of certain cycloplegics and myotics; concerning the normal position of visual axes; and concerning minimum and maximum duction, especially of the lateral muscles. The committee summarize the results obtained by this study of the anatomy and physiology of the ocular muscles as follows. We have:

First.—Corroborative evidence concerning the check ligaments, sufficient to warrant a definition of their extent.

Second.—Corroborative evidence of the existence and extent of the secondary insertions of the ocular muscles. All will probably now agree as to their clinical importance.

Third.—A few more exact dissections of the ciliary ganglion.

Passing next to physiology we have:

Fourth.—Corroborative evidence as to the power of accommodation with parallel visual axes.

Fifth.—New curves of the effects of cocain, showing the important fact that it has a cycloplegic action.

Sixth.—A curve for the action of homatropin, 1/50 of a grain.

Seventh.—Curves indicating that various strengths of eserin produce varying curves, showing its effect on the accommodation.

Eighth.—Corroborative evidence that orthophoria for the far point exists only in a small majority of cases.

Ninth.—There is a difference between minimum and maximum duction, the former being quite constant, the latter not ordinarily constant.

BOOK REVIEWS.

THE OPHTHALMIC YEAR BOOK. Vol. VII. By E. Jackson, Th. B. Schneideman and W. Zentmayer. Illustrated. The Herrick Book & Stationery Co., Denver, Colorado. 1910.

A new volume of this valued annual cannot but be welcome in every oculist's office. Like its predecessors in former years, this one gives a select résumé of the progress in ophthalmology as represented by the books and papers published in 1909. We note that Dr. De Schweinitz has found it necessary to withdraw from the coeditorship and that Dr. Zentmayer has been added to the staff. Every oculist should be in possession of this excellent book of reference which is gotten up with judicious carefulness.

ALT.

MEDICAL EDUCATION IN THE UNITED STATES AND CANADA. The Carnegie Foundation for the Advancement of Teaching. Bulletin Number 4, 1910. By Abraham Flexner, with an introduction by H. S. Pritchett.

This is a most noteworthy contribution to our knowledge on how medical education is conducted in the United States and Canada. The work seems to have been undertaken with the aim

of showing the medical public and the public in general what really a medical education in this age should be and how often it is still found to be insufficient. We believe that the work has been done conscientiously, and that, whatever criticisms the authors have to bear, they have done a good work which does not only redound to their own honor, but which is also producing and will in the future produce nothing but good for medical education, that is for humanity.

REMEDIA HOECHST. Pharmaceutische Produkte, Serotherapeutische and Bakterien—Praeparate der Farbwerke vorm. Meister Lucius and Bruening. Hoechst a. M. Victor Koechl & Co., New York.

The catalogue of this well known pharmaceutical house is considerably more than a simple compilation of their wares. By the scientific study of the therapeutic value of their preparations and the testimonials as to their clinical effects, which fill the larger part of this volume, the purely mercantile purpose of such a catalogue is very well disguised and the book thereby is rendered truly valuable to the reader.

DE L'AMELIORATION DE LA PROTHESE OCULAIRE PAR L'EHETEROPLASTIE ORBITAIRE ET LES OPERATIONS PSEUDOPLASTIQUES. (On an improvement in ocular prothesis by orbital heteroplasty and the pseudo-plastic operations.) By Dr. G. Bonnefon. Paris, 1909. C. Steinheil. Price 5 francs.

The author, assistant to Lagrange of Bordeaux, describes in detail his chief's method of producing a useful and lasting stump after enucleation by the transplantation of a rabbit's eye into the orbit. This description is preceded by an excellent analysis of the different and unsuccessful operations for the production of a stump for prothesis which have been invented and practiced since Chibret's first and unhappy implantation of a rabbit's eye into the human orbit.

As the numerous photographs accompanying the description of cases show, the method of Lagrange is evidently an admirable success, and it will be of undoubted profit to ophthalmic surgeons to study this report. ALT.

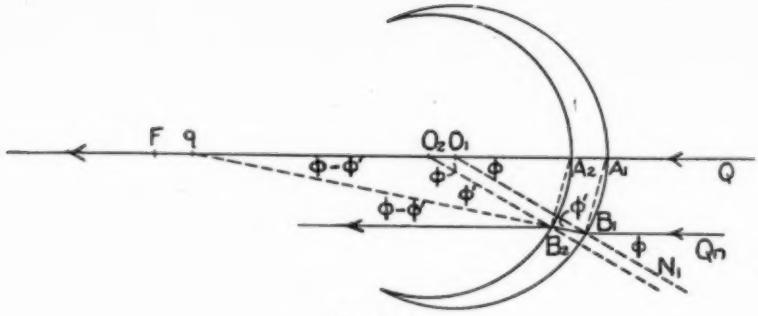

FIGURE 1.

(Taken from page 322, this Journal, November, 1909).